



## **Determining Land Surface Temperature Relations with Land Use-Land Cover and Air Pollution**

Ceyhan Kahya (1), Filiz Bektas Balcik (2), Yasar Burak Oztaner (3), and Burcu Guney (4)

(1) Istanbul Technical University, Faculty of Aeronautics and Astronautics, Department of Meteorological Engineering, Istanbul, Turkey (ckahya@itu.edu.tr), (2) Istanbul Technical University, Civil Engineering Faculty, Department of Geomatics Engineering, Istanbul, Turkey (bektasfi@itu.edu.tr), (3) Istanbul Technical University, Eurasia Institute of Earth Science, Climate and Marine Science, Istanbul, Turkey (oztaner@itu.edu.tr), (4) Istanbul Technical University, Informatics Institute, Geographical Information Technologies Istanbul, Turkey (brc.guney@gmail.com)

Rapid population growth in conjunction with unplanned urbanization, expansion, and encroachment into the limited agricultural fields and green areas have negative impacts on vegetated areas. Land Surface Temperature (LST), Urban Heat Islands (UHI) and air pollution are the most important environmental problems that the extensive part of the world suffers from. The main objective of this research is to investigate the relationship between LST, air pollution and Land Use-Land Cover (LULC) in Istanbul, using Landsat 8 OLI satellite image. Mono-window algorithm is used to compute LST from Landsat 8 TIR data. In order to determine the air pollution, in-situ measurements of particulate matter (PM10) of the same day as the Landsat 8 OLI satellite image are obtained. The results of this data are interpolated using the Inverse Distance Weighted (IDW) method and LULC categories of Istanbul were determined by using remote sensing indices. Error matrix was created for accuracy assessment. The relationship between LST, air pollution and LULC categories are determined by using regression analysis method.

**Keywords:** Land Surface Temperature (LST), air pollution, Land Use-Land Cover (LULC), Istanbul